Outcomes of the Education Data Solutions Roundtable (DRT)

**Felege Abay
Elementary School,
Bahar Dar, Ethiopia.**

Contents

Acknowledgments

Alice Albright delivers opening address at the final DRT Meeting in April 2019.

The Global Partnership for Education, which convened the Education Data Solutions Roundtable over the past year and a half, is grateful to the numerous partners whose technical, financial and other in-kind contributions ensured its success. The report that follows has sought to capture the rich expertise and varied perspectives offered by these partners on education data challenges, including the developing countries that attended meetings or hosted missions, the business community, private foundations, civil society and donor governments. In particular, we wish to acknowledge the high value of the two week-long field missions, hosted by the governments of Ethiopia and The Gambia and supported by other country-level partners.

A list of all those organizations engaged in the DRT, and to whom we express our warmest appreciation, follows below.

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School visit of the
DRT team, Ethiopia.

Executive summary

Quality education data is essential to inform planning and policy decisions by governments. Without data, it is impossible to build effective, resilient and accountable education systems. Equally, aggregated data is critical to monitor progress toward Sustainable Development Goal (SDG) 4. However, most developing countries lack both strong education information systems and the tools (and staff resources/skills) to communicate data insights in a manner that supports governments and partners to target resources appropriately—that is, to prioritize according to needs revealed by data.

The Education Data Solutions Roundtable (DRT), a public-private initiative convened by the Global Partnership for Education (GPE), aimed to leverage government, civil society, private and development partners' expertise to improve the availability and use of accurate and timely education data in developing countries and at global level.

The initiative also sought to engage with the private sector in a more concrete manner, recognizing the enormous potential of the business community to co-create innovative solutions and new technologies with other development stakeholders to drive improvements in education at community, regional, national and ultimately global levels—all while noting that to be transformative, any intervention to strengthen a country's data systems must be country owned.

The DRT makeup reflected the core GPE constituencies, including developing country partners (DCPs), international and regional development and technical agencies (multilateral and bilateral), civil society, the private sector and private foundations. The DRT process also intersected with the data workstream of the Knowledge and Innovation Exchange (KIX), which connects expertise, innovation and knowledge to help developing countries build stronger education systems.

After a period of extensive preparatory research that resulted in the creation of two papers outlining a conceptual framework for the work of each of these initiatives, the DRT was convened in February 2018. It met several times before holding its final meeting in April 2019. Members of the DRT also visited Ethiopia and The Gambia to better understand the education data challenges in these countries, and to recommend solutions that could be transformed into broader globally applicable solutions. In particular, the initiative acknowledged the catalytic role that strengthened education management information systems (EMIS) can play in addressing education data challenges.

> **Initial engagement by DRT members was driven by three main questions:**
>
> 1. What additional support do developing country partners need to improve their data systems and ensure a more effective use of data?
>
> 2. How can public and private partners work together to identify innovative solutions to enhance the use of data at country and global levels?
>
> 3. What new global investments can be made to improve the collection and use of data?

Thanks to the strong and continuous engagement of its diverse members, the group was able to develop a clear action agenda that development partners, including the business community, can begin to pursue collaboratively to strengthen data systems for education.

Building on the above, the DRT arrived at five final recommendations summarized on the opposite page. These include suggestions to support an enabling environment for better quality data and direct responses to some of the main technical challenges hindering effective country data systems. Underlying these recommendations is the understanding that, to be effective, any intervention to develop stronger data systems needs to be bolstered by a clear advocacy strategy—both to develop political will to invest in data for policy planning and management at the country level and to reinforce the importance of data as a priority at the regional and global levels.

This document's intent is to support DCPs by offering concrete, actionable recommendations for improving their education sector data production, flows, reporting and usage. Some are "quick wins," while others may be more complex and challenging, depending on country context.

Summary of key recommendations

1 Develop an institutional framework: Establish education data policy or protocols

- Drawing on existing education strategies (such as the education sector plan), and the mapping of current explicit or implicit data flows/processes/needs, an institutional framework should include an education data policy and protocols to guide the implementation of data management and use.

- Clarify responsibilities within the ministry of education as well as within other ministries that play a role in education.

2 Boost human resources and develop data competencies

- Ensure knowledge transfer of core information technology and data science skills to boost EMIS capacity at all levels. This could mean creating a pool of information technology specialists and data scientists to support EMIS in the short term while preparing a sustainable human resource plan for the long term.

- Focus on both attracting and retaining key staff through a variety of incentives.

3 Data integration and school IDs

- Set up unique and standardized IDs for schools, followed perhaps by learner and teacher IDs where capacity and robust security architecture exist. This should be accompanied by clear communication as to their value as well as guidance on best practice for implementation of IDs—a possible quick win.

- Address data integration sequentially and according to priorities and country context. This may involve integrating key EMIS data with a limited number of key data sets initially.

- Initiatives should include feedback loops as well as technical support (both financial and human resources).

4 Data technology and systems: Develop minimum functionalities for EMIS and define a technology upgrade path

- Formulate minimum standards for the technical specifications and functionalities of EMIS to improve the integration of data sharing systems, usability and accuracy—a possible quick win.

- More could also be done to share lessons learned from more established suppliers.

- Support DCPs in the development of a technology upgrade path that both encourages more effective deployment of their existing technologies and defines a pathway to leverage new technologies.

5 Promote a demand-driven data culture: Getting more insight from data

- Show and promote the value of actionable insights from data by using analysis and visualization tools for planning and policymaking, and reinforce community-led accountability by supporting school-level management through feedback loops. In particular, supporting the use of visualization tools to facilitate insights on data for high-level buy-in and decision-making may represent a quick win.

- Encourage policymakers to support investments in EMIS, and improve EMIS management at the country, community and school levels.

- Work at the country level to derive actionable insights for the policy and planning cycle, and to transfer knowledge and skills.

Teacher instructs class at Bundung Lower Basic School, Bundung, The Gambia.

Key recommendations

In response to the challenges identified through the report, the DRT identified three critical areas impacting data systems where the expertise of the full range of partners could be leveraged:

1. Better tools for education information management

2. Better data communication and visualization tools

3. Integration of data across different systems to produce holistic school-level information
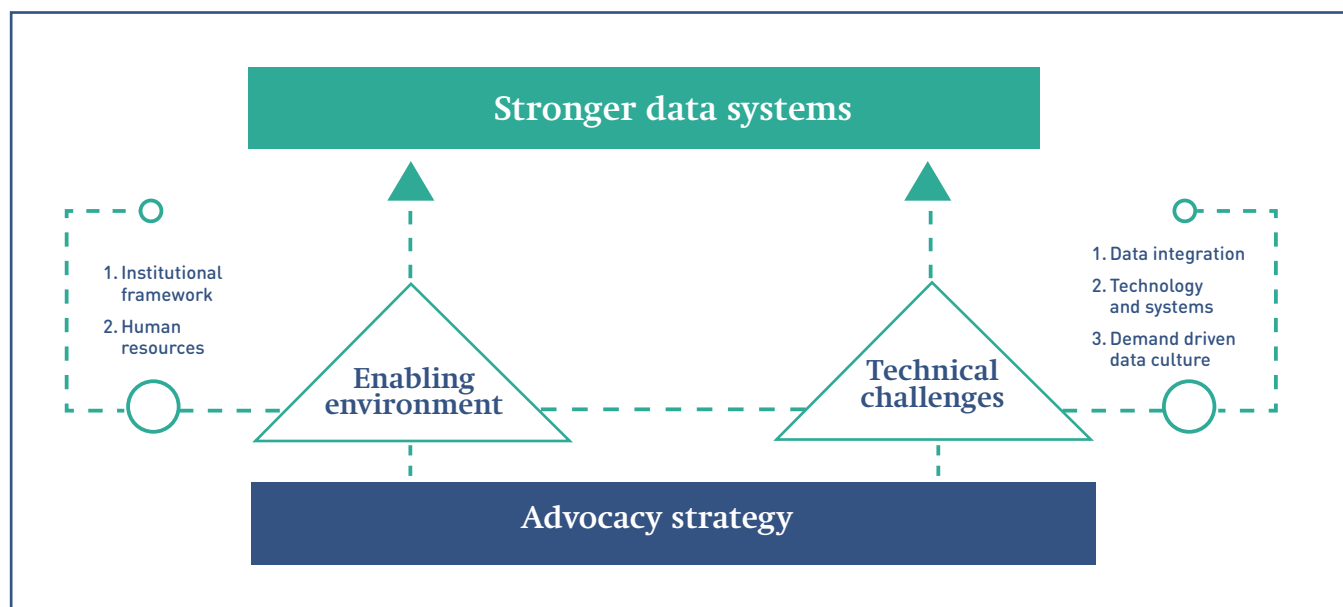
Overview

Over the course of its work, the DRT expanded its focus to include these additional areas:

❯ Advocacy to build the political support necessary to cement the importance of data for policy, planning and management, including monitoring and feedback loops.

❯ Establishing a broad education data policy or set of protocols governing production and use of education data, a lack of which reduces legitimacy and undermines clarity around roles and responsibilities. A lack of global guidance around standards and approaches in EMIS was also noted.

❯ Support the development and retention of human resources with IT competencies (coding and database management) as well as data production and analysis capabilities.

Building on the above, the DRT arrived at five final recommendations that include suggestions to support an enabling environment for better quality data (elaborated in recommendations 1 and 2) and direct responses to some of the main technical challenges hindering effective country data systems (elaborated in recommendations 3, 4 and 5). Some of the recommendations are "quick wins," while others may be more complex and challenging, depending on country context.

Underlying these recommendations is the understanding that, to be effective, any intervention to develop stronger data systems needs to be bolstered by a clear advocacy strategy—both to develop political will to invest in data for policy planning and management at the country level and to reinforce the importance of data as a priority at the regional and global levels. These elements and the final recommendations are illustrated in Figure 1.

FIGURE 1. DRT RECOMMENDATIONS TO SUPPORT STRONGER DATA SYSTEMS

1

Develop an institutional framework: Establish education data policy or protocols

Drawing on existing education strategies (such as the education sector plan) and the mapping of current explicit or implicit data flows/processes/needs, an institutional framework should include an education data policy or protocols to guide the implementation of data management and use. It should also clarify responsibilities within the ministry of education as well as within other ministries that play a role in education.

Many issues related to systems inadequacies are less about technology and more about policies, institutional organization, people and processes. According to the literature and findings in the field, most developing countries lack a national EMIS strategy/policy, or more broadly a set of protocols governing roles and responsibilities in the collection and use of education data as well as providing a blueprint for security and privacy. Colleagues in both The Gambia and Ethiopia stated the need to have a solid policy as perhaps the main priority for improving the quality of their work. They noted that not having an education data policy makes the budget, bureaucratic status and staffing of data efforts uncertain and subject to frequent shifts that reflect changing government and development partner priorities. Lack of a clear policy, they noted, hampers the institutionalization and resourcing of data work and contributes to a lack of coherence of mandates and responsibilities across institutional units involved in the education system.

Key findings

- More guidelines around data systems processes, procedures and mandates are needed. Broad protocols should precede specific guidelines (for example, human resources payroll, privacy). While the primary objective is institutionalizing policies/protocols at the country level, there may also be value in exploring what kinds of global public goods (for example, best practice or case studies) could be developed to support countries.

- In both Ethiopia and The Gambia, it was noted that as systems pivot from an emphasis on access to encompass both access and learning, data policy should acknowledge the need to support that pivot. In particular, the specifics of a policy focused on data for access planning might be somewhat different from those relevant to a policy for the management of learning improvement. Both Ethiopia and The Gambia (with the Association for the Development of Education in Africa) were either planning or beginning to execute data policy work. One could learn lessons from these attempts that might be useful in other countries.

- Mapping of current explicit or implicit data flows/processes/needs is a critical precursor to the development of an effective policy/set of protocols. It would help cement a focus on the demand side, in turn creating appetite for the development of more sustainable practices for data collection and use.

- Any policy/protocols should be grounded in education policy in the country as articulated in education white papers, sector plans etc. as well as align with any existing broader national data strategies, such as national guidelines on data protection and privacy. It is important to ensure there is no overlap between new and existing policies.

- Policies should be comprehensive and specific, with a primary focus on EMIS, but also including a broader consideration of all education data as well as the adoption of best practices.

- The final education data policy/protocols should also encompass an implementation strategy, elaborating on proposals in the education sector plan, and consider not just technology (or not mostly technology) but also institutional incentives to produce and use data.

- Key issues to be addressed within any national education data policy/protocols:
  — Describe who has access to data within the ministry of education, government and the general public, and address appropriate strategies for documentation of metadata, privacy issues, storage, access and sharing/integrating within the education ministry and with other ministries. Sharing of integrated data sets could be phased.
  — Clearly outline accountability relationships and networks between and within national, regional and local government as well as other key departments (for example, health, bureau of statistics or equivalent), agencies accountable for education (for example, inspection, higher education), and education institutions (schools, colleges).
  — Clearly articulate responsibility of individual institutions in terms of data collection, identifiers, sharing and more. In particular, note that these issues of responsibility for data production and rights to the data, across levels of government, are far more complex and legalistic in countries with a federal administrative structure, such as Ethiopia. This is also the case in highly decentralized countries, even if they are not technically federal systems.
  — Ensure policy/protocols are robust to changes in technology.

- Policy should ultimately be country owned and authored.

Additional considerations

- Leverage any current plans (or mandates) to work on strengthening the institutional environment, if they exist (for example, in the education sector plan, or in a grant/loan conditionality).

- Acknowledge/study any previous efforts in this area and the reasons why those efforts have (or have not) succeeded.

- The process of developing the education data policy would offer the opportunity to bring together key data actors and to develop and strengthen coordination mechanisms.

2

Boost human resources and develop data competencies

Ensure knowledge transfer of core information technology and data science skills to boost EMIS capacity at all levels. This could mean creating a pool of information technology specialists and data scientists to support EMIS in the short term while preparing a sustainable human resource plan for the long term. Focus on both attracting and retaining key staff through a variety of incentives.

Data skills are a rare commodity in many countries. As a result, EMIS and other data-intensive units face high turnover, with staff often leaving for other opportunities and sectors after acquiring skills. This calls for creative solutions to support greater permanence of skills in the education sector, through better staff retention and/or in-service training and certification.

Furthermore, fairly technical areas with high demand for data experience insufficient capacity. In cases where development partners have been building EMIS capacity over time yet gaps remain, structural issues may need to be addressed. In particular, while development initiatives have for decades recognized the importance of developing human capital, skills development has typically focused on capacity for education planning, with little attention paid to developing programs for IT skills in the education sector.

Key findings

- Skills development programs should focus not only on traditional IT-specific skills but also on data science, privacy and cyber security.

- A senior Gambian counterpart remarked that as soon as staff acquire technical skills, they become as marketable as "hotcakes in the market." During our visits, the EMIS units in both countries faced concrete staffing uncertainties owing to market pull from non-governmental organizations (NGOs), the private sector and other ministries.

- Improving staff motivation is a key challenge. This may or may not include factors such as income, career pathways, workplace stimulation, opportunity for creativity, exposure to good leadership and a sense that the work matters because data are used in education decisions.

- National and regional institutions of higher education may be viable sources of pre-service training, in-service training and analytics advice/consultancy, especially where longer-term relations of trust exist.

- Possibility in the short term of facilitating a surge in capacity in areas that continue to be challenged (for example, data analytics) through secondments, semi-formal training and/or learning by doing. This represents a particularly strong opportunity for private sector collaboration/contribution.

Additional considerations

- It will be important to ensure that incentives across ministries, multilateral partners, NGOs and the private sector are aligned, to ensure human resource strategies that support staff retention.

- Innovation typically requires regular exchange of ideas. Productive engagement to foster innovation may therefore require a minimum staff complement—not just to complete basic tasks, but to work together to develop new ideas and new ways of doing things.

- Ensure staff development approach supports the development of feedback loops for data, from central to regional to school level; that is, stakeholders and staff are able to collect, understand and use education data required to inform management and planning at various levels.

- Skill sets should be aligned with roles to avoid staff being deployed for the wrong tasks (for example, a database engineer running data analyses when a statistician would be better placed to undertake this work).

Alice Albright congratulates graduates of new teacher training center, CRFPE (Centre Régional de Formation des Personnels de l'Éducation), Senegal.

GPE/ Carine Durand

- Linking to recommendation 5: Consider not just ministry staff's ability but also stakeholders' ability (including that of parents) to consume and use data. Sharing data with other stakeholders (including parents) may build data (consumption) competences and create greater demand for quality data.

3 Data integration and school IDs

Set up unique and standardized IDs for schools, followed perhaps by learner and teacher IDs where capacity and robust security architecture exist. This should be accompanied by clear communication as to their value as well as guidance on best practice for implementation of IDs—a possible quick win. Address data integration sequentially and according to priorities and country context. This may involve integrating key EMIS data with a limited number of key data sets initially. Initiatives should include feedback loops as well as technical support (both financial and human resources).

Integration of education databases is critical for getting the greatest possible mileage out of data, and unique and standardized IDs are a fundamental requirement for this—that is, unique school and eventually learner IDs across key databases, such as school census, school inspections, learning assessments, human resources, finance and other. When different agencies/units—both within and outside of the education ministry—collect data with different unique identifiers for each unit, it becomes difficult to merge data sets.

This issue is prevalent in non-EMIS systems in ministries for example, exams and assessment, cost, grants, school inspections and quality assurance and in other ministry databases for example, poverty maps, and it may also exist within the EMIS system making it difficult to follow schools over time, even for simple enrollment indicators.

In the long term, there is scope to integrate data from other sectors to improve decision-making—for example, in Ethiopia the Ministry of Agriculture needs education data to plan for the provision of school meals; the Ministry of Labor and Social Affairs for special needs citizens management; the Ministry of Finance for the sector budget, the National Planning Commission for the national development plan, and so on. Any multisector data integration initiative must ensure value for the end users, with the highest standards of privacy and security.

- Securing school IDs initially, and then learner IDs, may be the most realistic path of action initially, given capacity constraints and the requirements to have a robust security architecture in place. Learner IDs should adhere to the highest standards of data protection—that is, a strong focus on privacy and security issues. However, it is important that a phased approach does not overburden the system.

- To reduce stakeholder resistance, stakeholders need to clearly understand the benefits for them. Development of IDs (school and learner) should be embedded in a communication strategy to reflect value add and illustrate successes, both through ongoing policy dialogue and by leveraging traditional broadcasting channels as well as social media.

- Selected case studies on successful implementation of both school and learner IDs would allow for learning from other country experiences. A first step may be to support the development of knowledge products setting out how some countries have achieved progress on school IDs. A possible quick win might include guidance on best practice for implementation of school and learner IDs.

- Although learner IDs may allow individuals in countries affected by fragility or conflict better access to services (for example, school meals), there needs to be careful consideration of levels of personal data protection before implementing these IDs.

- There is the temptation to aim for the "ideal" of fully integrated systems, including with other sectors, but data integration should be addressed sequentially and according to priorities, with education databases and a clean, updated, valid and officially endorsed master list of schools being high priority (where these have not already been achieved).

- Initial in-country exercises could focus on integrating key EMIS data with a few key data sets—such as exams and assessment data, cost and resourcing data, and inspection data—and illustrate the value of actionable insight derived from integrating existing data.

- There is a need to assess country context to set up a realistic plan of progressive improvement that could include
— Mapping the different existing databases of the education ministry (for example, traditional EMIS such as school census, exam database, human resources database, finance database), including the information these capture and how they are used; and
— Analysis of where highest priority for data integration exists (where integrating information could bring the most value to decision-making, research, planning, monitoring and supporting schools, involving communities, and so on).

- Establish definitions where they do not exist. Some countries do not have "data dictionaries" (for example, a school could be defined as a building, a particular management team, a management team and groups of children, or other).

- The Gambia has started down the path of integrating data sets in producing report cards and giving schools planning information that include data on relative advantage (for example, funding) of the community, student flows and learning outcomes. These are informative. These techniques were partially inspired by the Data Must Speak initiative of UNICEF and similar efforts. But the process could be automated more, as it was noted that the production is relatively onerous.

- Governance structures must be considered in decentralized countries, noting appropriate level for approval of reforms (for example, school, district, region, national).

- Focus on key systems initially, to ensure managers and administrators do not feel overwhelmed and get frustrated. In Ethiopia, three key EMIS activities were selected initially to start using school IDs: learning assessments, grants and school inspection.

- Feedback loops are needed, via supervision, monitoring and close follow-up. It is also important to embed capacity-building opportunities so that users understand the value of a robust ID system. Technical support, though not always included in strategic plans, is a must—for both financial and human resources.

Gambia Bundung Lower Basic School, Bundung, The Gambia.

GPE/Jim Cham

Additional considerations

- Political economy may be one reason why there are no school IDs; for example, the absence of IDs (or information not traceable over time) allows for discretion in resource allocation. There may also be legal or accountability issues at stake, or perceptions of losing power. Agreement on the need for IDs among stakeholders at all levels is important; this may be supported by an accountability and reward system agreed on by all stakeholders, bearing in mind how incentives may affect (accurate) reporting.

- Stakeholder advocacy and agreement is central to the success of establishing school IDs and should be supported by a campaign at all levels of the education architecture to raise awareness and knowledge (that is, why we are investing on this). Ethiopian experience suggests that important lessons were learned through exposure to the experiences of other countries (Finland, South Africa, the United Kingdom) and external technical assistance.

- Failure to adopt school IDs in many cases reflects a problem with perceptions around how data should be used. It is often thought of as something to be collected at one point in time for a one-year reporting timeline, without the long-term view of tracking a particular unit over time. Institutionalizing a data policy and addressing institutional/organizational constraints would help support effective implementation of ID systems.

- Opportunities exist to exploit efficiencies, improve quality and/or enable cost savings if core EMIS data is cross-checked with the same data that is collected through another system (for example, student assessments, school report cards, teacher allocation).

4

Data technology and systems: Develop minimum functionalities for EMIS and define a technology upgrade path

Formulate minimum standards for the technical specifications and functionalities of EMIS to improve the integration of data sharing systems, usability and accuracy—a possible quick win. More could also be done to share lessons learned from more established suppliers. Furthermore, countries could be supported in the development of a technology upgrade path that both encourages more effective deployment of their existing technologies and defines a pathway to leverage new technologies.

In some countries, data systems (software functionality and architecture) are stretched to the limit: ad hoc queries are laborious, systems do not allow integration, Excel sheets are used when databases would be a better solution, among other issues. A strong contribution from education partners would be to prepare standards of functionality and performance, as well as a "buyer's guide" to assist authorities in thinking about their EMIS improvement path and education ministries can procure EMIS that have internationally accepted standards that are robust to rapid changes in technology.

Key findings

- A possible quick win is to develop a "buyer's guide" (global public good) for basic minimum standards with case studies. Key principles and issues to address include the following:
— Cloud-ready, even if not necessarily on the cloud at the outset
— Connectivity and availability of data centers
— Cloud storage (this may involve a hybrid strategy: physical and cloud storage)
— Master list of schools with permanent IDs
— Scalability and ability to adapt to local languages
— Standard for exchange, event-based tracking for competency framework alignment, conforming to Institute of Electrical and Electronics Engineers (IEEE) and related global standards for learning data and learning technology, conforming to International Standards Organization (ISO) and related standards for time and location as well as processes, as relevant
— Policies related to data management, as well as roles and responsibilities (see recommendation 1)
— Cybersecurity and privacy

- Other considerations might include ensuring that data is exportable to other formats (for example, CSV, JSON) and reviewing the possibility of data entry through use of a mobile device, both synchronous and asynchronous. Note, there is no assumption here that countries are literally buying new EMIS software. But a "buyer's guide" would provide key information as to what upgrades, modules or functionalities countries may wish to add.

- Drawing on lessons learned from existing suppliers or providers would also be a useful first step. GPE has started down that path by holding a webinar with the suppliers of OpenEMIS, m360 SIS (descendant of Global ED*ASSIST), StatEduc2.0 and DHIS2. More could be done to systematize this knowledge and add products that may not have the long history that these do. This could occur as part of the standard-setting exercise noted above, or independently.

- Any technology upgrade path must allow for the most basic inputting of data and download in areas without connectivity (or even electricity). Offline entry, asynchronous uploads, and in many cases pencil and paper or hard copy entries may need to be assumed for some time, so that schools in such areas are not left behind in initiatives to strengthen national data systems.

Additional considerations

- Need to work toward increased acceptability of electronic as opposed to paper transfer of information, using digital stamps that are equivalent to current rubber stamps. Fears of data being corrupted by users other than those who own the data can also be guarded against with appropriate security measures and password protection. Sharing can also take place without necessarily allowing online access to databases. There are also capacity issues to implement the more advanced information needs required here.

The GPE Secretariat

School visit during the DCP constituency meeting in Nepal, June 2019.

5

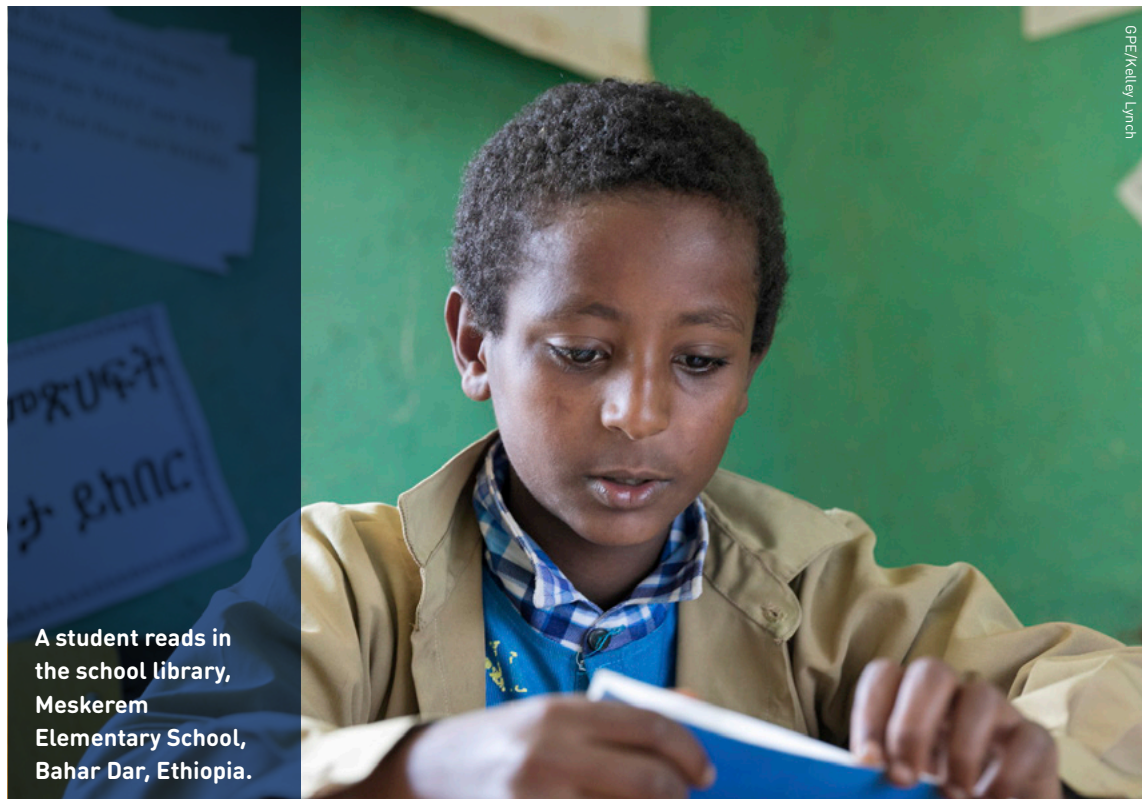# Promote a demand-driven data culture: Getting more insight from data

Show and promote the value of actionable insights from data by using analysis and visualization tools for planning and policymaking, and reinforce community-led accountability by supporting school-level management through improved feedback loops. In particular, supporting the use of visualization tools to facilitate insights on data for high-level buy-in and decision-making may represent a quick win. Having more insights from data would encourage policymakers to support investments in EMIS, and improve EMIS management at the country, community and school levels. DRT members also supported the idea of working at the country level to derive actionable insights for the policy and planning cycle, and to transfer knowledge and skills.

For EMIS efforts to get appropriate levels of support and budget, the value add of the data produced needs to be clear. However, countries often have more data than they are using to derive powerful insights of interests to policymakers. This tends to hamper EMIS development, as potential supporters of EMIS do not see sufficiently insightful products that can support them in their day-to-day work—indeed, decision makers often associate EMIS with large, fairly raw data compiled in long, hard-to-digest reports (for example, in printed yearbooks). Data traditionally produced for numerical planning purposes, including for access, enrollment and completion, in any case typically did not require much value to be added.

In light of these factors, there is often insufficient demand for data; stakeholders are not accustomed or trained to expect policy debates and decisions to draw on data, or to demand proof that decisions are data based. Past efforts to improve data systems have often been "supply led" and emphasized software, hardware and building of skills around simple automated queries, rather than mining and analysis of data for deep insights. Furthermore, the function of adding value to data often falls to the education ministry's planning section (or even outside the ministry: consultants, NGOs, other ministries), further undermining the role of EMIS as well as direct resource support for it.

Currently, data are more often used for planning and policy around issues like access and for the management of quality, only from the perspective of inputs rather than of key outcomes. In addition, data tends to be used for top-down and bottom-up reporting against planning targets, but less so for horizontal accountability at the school or district level. EMIS could be redesigned as an education delivery platform with education resource flows integrated into the data framework—for example, recording of school grant disbursements could be built directly into the EMIS platform, given that school grant allocations already use key EMIS data, including student enrollment, the deployment of teachers and the number of classrooms in a given school.

The aim behind this recommendation is to produce more "aha!" experiences for policymakers and managers at the regional, district and school levels, as well as for civil society organizations, including at the local community level, to secure their trust and support of EMIS and other data products. Developing demand for data, especially at the district and school levels, where activities are more likely to translate into learning outcomes, is likely to encourage high-level buy-in and investment in EMIS, and ensure that generating better data becomes a priority within the ministry.

GPE/Kelley Lynch

A student reads in the school library, Meskerem Elementary School, Bahar Dar, Ethiopia.

Key findings

- One approach might be to accompany the ministry through a yearlong policy, planning and budgeting cycle and create products that enhance the use of data, including visualization—a possible quick win. Focus here should be on communication of these insights horizontally (to other ministries, parliament and civil society) as well as vertically (up and down) to schools and other subnational levels (for example, province or district).

- The Gambia has made a useful start in producing visualization for communication to schools and to help schools plan and communicate to their communities. However, the process could be automated more, more thought could be given to the right proportion of tabular to visual information, and so on. In both The Gambia and Ethiopia, better use of graphics for communicating "horizontally" with other ministries might be useful. Similarly, websites could be made more communicative through the use of visualization.

- Any initiative to derive insights from the data (as per the consideration above) is likely to need—and therefore ideally stimulate support of—the integration of data sets (in particular solving problems of inconsistent school and learner/teacher IDs, both in EMIS and across other units of the ministry). Depending on country context, merging of relevant data sets might need to be a manual process initially; however, as the value of this exercise is demonstrated, it will justify making integration possible in a more permanent and automated manner.

- Improved insights from data not previously achievable may include the following:
  - Simple outlier analysis to identify and analyze schools that greatly exceed expectations or underperform
  - More complete analysis of learner, school and community needs, by combining data sets from other sectors, such as poverty and health and nutrition assistance (for example, World Food Programme in both Ethiopia and The Gambia)
  - More accurate understanding of relationship of certain indicators (for example, test results, qualification level of teachers) with actual school performance, offering feedback to the inspection and licensing system, respectively (which seemed to be of particular potential interest in Ethiopia)
  - Tools that help manage absenteeism and dropouts at the local level while also enabling reporting up
  - Better use of the many forms of learning data (including from school, national and international tests) to manage the learning process, not just exert accountability and track learning

- Surveys of all potential users' data needs would help identify where data insights would be most valuable.

Additional considerations

- A clear education data policy (see recommendation 1) should specify the kinds of uses and insights from data that ministries and society can expect.

- Efforts to increase demand for quality data need to address issues around the lack of human resources with data analytic skills and challenges to retaining staff (see recommendation 2).

- While gleaning insights from data-for-management remains the most neglected of data possibilities, there are nonetheless many outstanding issues with more basic data requirements (for example, better understanding absenteeism and dropout patterns; when dropout rates reflect real dropouts versus transfers).

Appendix A.
The education data challenge

As part of its preparations for the design and launch of KIX and subsequently the DRT, the GPE Secretariat developed two papers outlining a conceptual framework for the work of both initiatives.[1] In addition, country briefs were prepared and shared with DRT members as pre-reads for the two one-week country visits, based on an extensive analysis of the country-specific literature on education data.[2] The material in this section borrows liberally from that work.

Table A1 reflects on the weaknesses or opportunities for more effective use of data. The first column summarizes the main sources of education data available in developing countries (data sources), while columns two through four indicate key deficiencies in linked to each data sourceacross three areas: (a) system management and accountability, (b) evidence-based policy and planning, and (c) global reporting (and similar tasks).

TABLE A1. GAPS OR WEAKNESSES IN CURRENT USE OF KEY EDUCATION DATA

Data sources	System management and accountability	Evidence-based policy and planning	Global reporting (and similar tasks)
Routine EMIS and other administrative data systems	Limited use of data for monitoring and improvement of school performance and social accountability owing to: • Lack of production and dissemination of data that provide complete profiles of each school • Lack of student-level data	Timely data missing in key areas such as finance, learning outcomes, disability, equity Insufficient integration with non-EMIS data sources Insufficient value add Relatively little use of data for policy dialogue and discussion with other ministries and CSOs	Timely data missing in key areas such as finance, learning outcomes, disability, equity
Household and school surveys	n/a	Relatively little use for specialized and in-depth needs, unlike in the health sector	Possibly useful, especially for designing specific issues including equity
Real-time monitoring tools, including school- and classroom-based	Use of knowledge/insights derived from existing tools (e.g., classroom observation checklists for teacher coaches) for policy and planning and/or for routine management relatively lacking Use of real-time data more prevalent when it comes to general schooling access than for learning outcomes or for the specialized needs of the most vulnerable		n/a
Randomized controlled trials (RCTs) and other evaluations (As this refers to data in a loose sense (and is technically research), gaps in this area are not emphasized in this paper.)	n/a	Progress in this area often "supply led" (i.e., led by those with an interest in evaluation) rather than "demand led" (i.e., led by those with an interest in the relevant outcomes) Policy often based on pilot projects or simply ideas that have not always been well evaluated. Considerable debate also around the utility of RCTs	n/a

1   "Meeting the Data Challenge in Education through Knowledge and Innovation" (for KIX) and "Data in Education: Draft discussion paper" (for DRT), the former being the basis of the latter, were previously shared with DRT members, and are available on request from the Secretariat. The papers were based on empirical analysis of existing EMIS and data evaluations in multiple countries (via desk review); extensive consultation with key informants; and considerable GPE staff experience with data and EMIS capabilities across a range of developing countries. Both papers were updated to reflect country insights gathered from the joint UNESCO-GPE conference held in Paris in April 2018 (see steps taken in Appendix C).

2   Country briefs for Ethiopia and The Gambia are available on request from the GPE Secretariat.

In light of the above gaps, the KIX framework paper identified three broad areas for potential education data investments: (1) knowledge transfer, capacity development and learning exchange (strengthen national capacity); (2) evidence/evaluation; and (3) innovation.

Table A2 summarizes key opportunities for investments under KIX (an initiative that has a particular focus on the development of global public goods) as well as indicates (see shaded areas) which of these ideas were further explored by the DRT, as discussed in the body of this report.

TABLE A2. ADDRESSING GAPS OR WEAKNESSES IN CURRENT USE OF KEY EDUCATION DATA: AREAS OF INVESTMENT IDENTIFIED UNDER KIX AND LINKAGES TO DRT
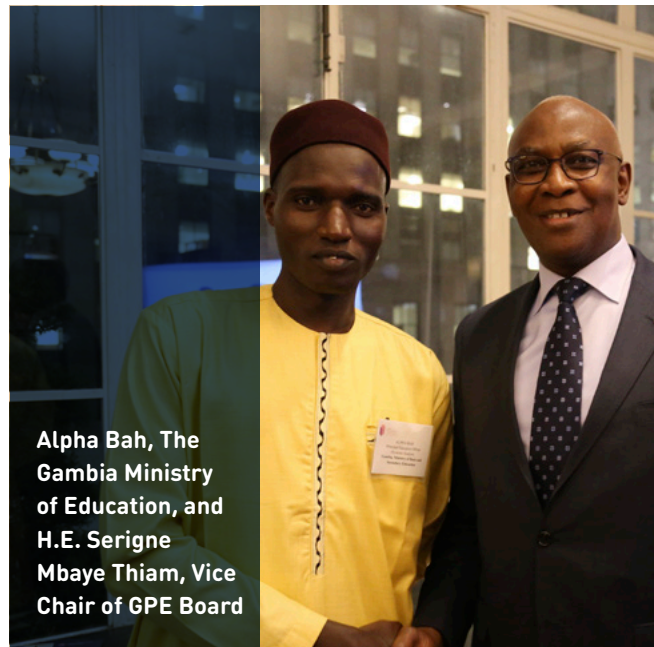
Areas for investment	Potential global goods
1. Knowledge transfer, capacity development and learning exchange (strengthen national capacity)	Creation of regional or global hubs to support country capacity to improve collection, management and use of data
	Signposting/streamlining of existing EMIS diagnostic tools, and **development of coherent and coordinated standards for data systems**
	Development of modular, open-source and adaptable solutions, especially for fragile and conflict-affected settings
2. Evidence/evaluation	Creation of evidence on **user needs and habits at the school and district levels** to inform EMIS design and improve data utilization
	Documentation of best practice in the production and use of **student-level records** in education for sharing across the partnership
	Documentation and assessment of opportunities to use **technological innovations to improve data availability and use**
3. Innovation	Piloting of new approaches for including new types of data and data from multiple sources: • On underserved populations in out-of-school children, children with disabilities, children from displaced populations, in EMIS • Data from multiple sources at the national level • Integration of learning assessmenta
	Creation of a cross-national digital platform for combining and sharing education data across countries
	Piloting of innovative approaches to data presentation and visualization, to **support real-time use of data**

Appendix B.
Principles for working together

An enunciated set of principles for the DRT collaboration helped align expectations and lowered transaction costs. The following principles were introduced at the DRT meeting on the margins of the United Nations General Assembly meetings in New York (September 2018):
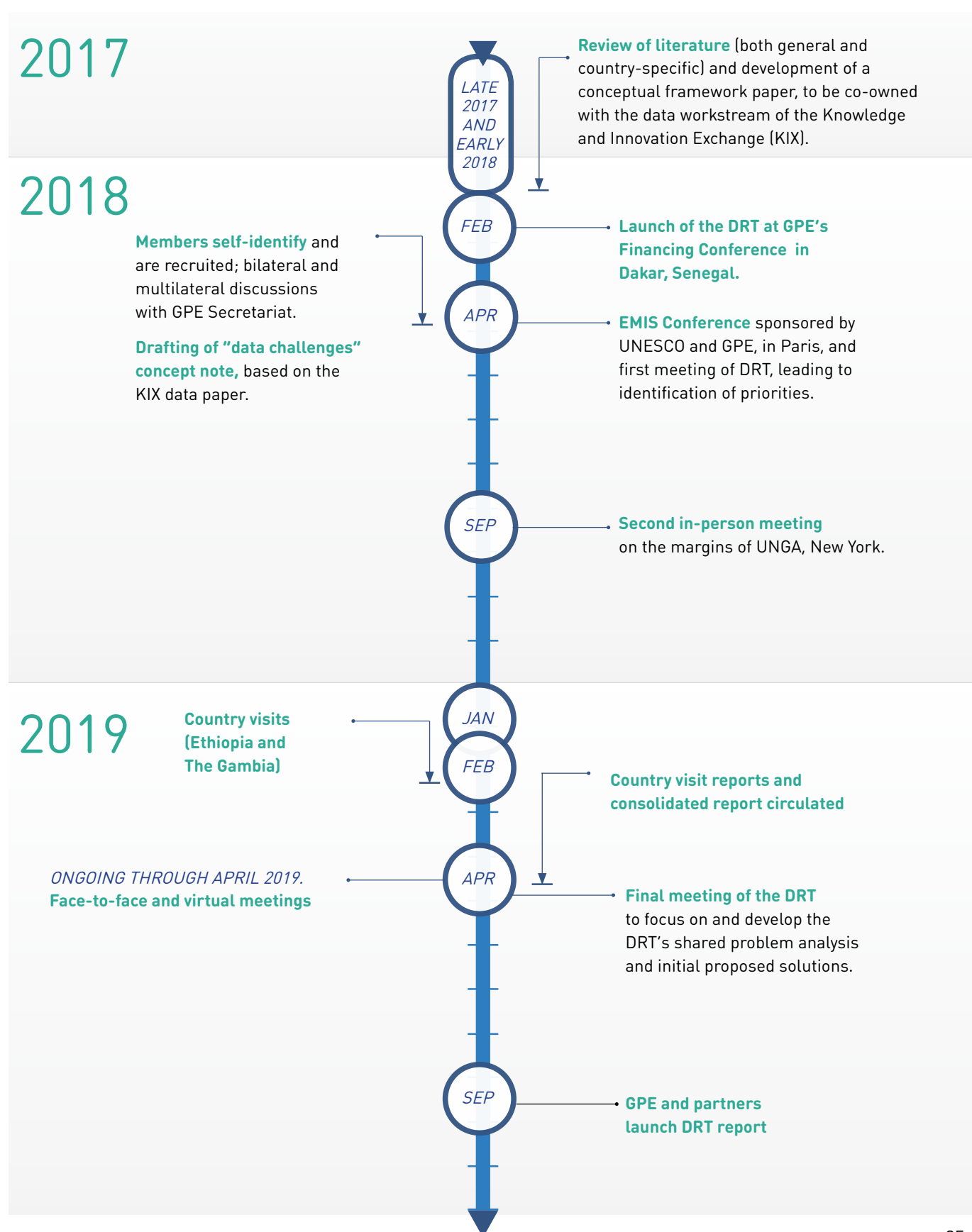
❯ Country centered, with emphasis of country ownership

❯ Shared value partnership and collaboration

❯ Own costs and liabilities (each partner bears its own costs)

❯ GPE independence, non-exclusivity and non-endorsement of particular corporate approaches/products

❯ DRT output owned by all (a public good)

❯ Confidentiality/privacy/security of data is a priority

❯ Coordinate with existing efforts on data by countries and technical partners (non-duplication of efforts)

❯ Decision-making as to data needs to be driven by (a) what key decisions do countries need make to support better education systems? and (b) what do countries need for advocacy and policy?

❯ Emphasis on production of data at the school level with reporting as a by-product of usage

❯ Innovations with a design-centered approach that are simple and address infrastructural, managerial and economic realities of the environment

Alpha Bah, The Gambia Ministry of Education, and H.E. Serigne Mbaye Thiam, Vice Chair of GPE Board

❯ Solutions that allow for real-time management and tracking at all levels to create the desired impact

❯ Understand political economy of data and data usage within the environment

❯ Solutions should address both global-level and national/community-level data needs as well as synergies between the two

❯ Embed mid- to long-term capacity requirements in proposed solutions to reinforce sustainability in implementation

❯ Consider both quick wins (for example, "surge" in capacity) and longer-term solutions

❯ We believe that members benefit from the collaboration in a manner more or less commensurate with the effort they put in

Appendix C.
Working methodology

The DRT was launched at GPE's Financing Conference in Dakar, Senegal, in February 2018. The last formal meeting of the group was held in April 2019. Below is an overview of the workplan, process and timeline.

2017

LATE 2017 AND EARLY 2018

Review of literature (both general and country-specific) and development of a conceptual framework paper, to be co-owned with the data workstream of the Knowledge and Innovation Exchange (KIX).

2018

Members self-identify and are recruited; bilateral and multilateral discussions with GPE Secretariat.

Drafting of "data challenges" concept note, based on the KIX data paper.

FEB

Launch of the DRT at GPE's Financing Conference in Dakar, Senegal.

APR

EMIS Conference sponsored by UNESCO and GPE, in Paris, and first meeting of DRT, leading to identification of priorities.

SEP

Second in-person meeting on the margins of UNGA, New York.

2019

Country visits (Ethiopia and The Gambia)

JAN

FEB

Country visit reports and consolidated report circulated

ONGOING THROUGH APRIL 2019. **Face-to-face and virtual meetings**

APR

Final meeting of the DRT to focus on and develop the DRT's shared problem analysis and initial proposed solutions.

SEP

GPE and partners launch DRT report

Country visits The visits to Ethiopia and The Gambia were a defining characteristic of the DRT effort for two reasons. First, the visits enabled the DRT to "ground-truth" its ideas, derived from the literature, key informants and previous DRT discussions, in two real situations. The group also sought to propose actions of real interest to these two countries after listening to and learning from the respective national counterparts. Note that the intention was not to leave behind implementable plans, or even to draft terms of reference for such plans—the ideas would need to be approved by a set of country stakeholders broader than were engaged during the visits. Second, the visits allowed the DRT to work together much more intensely than would have been possible via a series of face-to-face and virtual exchanges (outside the countries) only. For this reason, we take some time to detail the nature and process of the country visits.

The two countries were selected for continuity, given their participation in the GPE-UNESCO EMIS conference in Paris in April 2018, as well as on the basis of their confirmed interest in and commitment to working toward improvements in their EMIS. They faced different structural challenges (Ethiopia is a large federal state and The Gambia a far smaller country) and therefore gave the group good perspective on EMIS needs in very different contexts. Actionable ideas were shared with the countries in reports prepared by the GPE Secretariat in consultation with the DRT country visit teams (these are available on request from the Secretariat), and in slide decks. These ideas were specific enough to provide ministry officials with an initial guide as to what eventual plans might contain.

In both Ethiopia and The Gambia, the teams visited a cross section of data producers and users, as well as actors with a supervisory interest in the data flow between producers and users. The design of the agenda for each visit was led by the country's ministry of education, to ensure that DRT members engaged with those stakeholders the country deemed most relevant to better understand their respective EMIS. This included the following list of actors, in approximate chronological sequence:

- Higher-level officials in the ministry of education

- EMIS officials

- Other units in the ministry of education (or semi-autonomous sectoral authorities) that use or produce data, or should do so (for example, finance and budget, planning, assessment and curriculum, teacher management)

- In-country development partners with an interest or projects in EMIS or education data more generally

- Schools and decentralized subnational offices

- Civil society as relevant

- Other ministries—those using education data and producing data useful to education, as well as data regulators and overseers (for example, finance, planning, central statistical agency, health)

Each country visit was one week in duration (Monday to Friday), with a few days of in-country advance work by the Secretariat. The team debriefed the lessons emerging from the visits at least once per day, usually for 30 to 45 minutes. On the Thursday, the team developed, in as close to a consensus as possible, a set of actionable ideas to discuss and then present to the ministry of education on Friday, the last day of the visit. Despite the vastly different agencies represented (public and private, multilateral and bilateral, data production-oriented and usage-oriented, and so on) close to a 100 percent consensus was achieved. The use of e-voting and word cloud technology to drive voting and consensus was useful.

Finally, a draft version of this report was reviewed and vetted by DRT members, to reach agreement that the findings and recommendations here reflect both the agreed approach of the DRT collaboration and the range of views across the group.